

## ABSTRACT OF THE DISCLOSURE

Photomask repair and fabrication with use of direct-write nanolithography, including use of scanning probe microscopic tips for deposition of ink materials including sol-gel and metallic inks. Additive methods can be combined with subtractive methods. Holes can be filled with nanostructures. Heights of the nanostructures filling the holes can be controlled without losing control of the lateral dimensions of the nanostructure. Chrome-on-Glass masks can be used and fabricated, as well as phase shifting masks (PSMs) and more advanced masks including masks for nanoimprint nanolithography.